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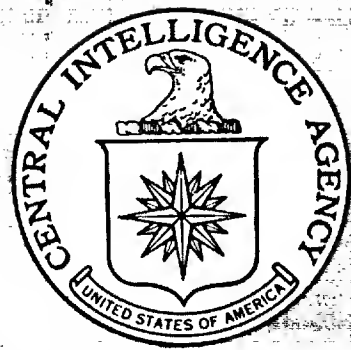
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MAP RESEARCH BULLETIN



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MAP RESEARCH BULLETIN

MR-258

CENTRAL INTELLIGENCE AGENCY

May 1951

SECRET

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Note: This Bulletin has not been coordinated with the intelligence organizations of the Departments of State, the Army, the Navy, and the Air Force.

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I. MAP COVERAGE OF TURKISH INTERNATIONAL BOUNDARIES

Turkey is of interest today less because of its resources than because of its strategic position. In the northwest, Turkey straddles the Bosphorus and the Dardanelles, the only exit for the Soviet ports on the Black Sea. It also occupies a position between Europe and the rich oil fields of Iran, Iraq, and Arabia. In spite of its long coastline on the north, west, and south, Turkey has land frontiers with six other countries. In the northeast, Turkey borders directly upon the USSR; in the northwest it has land boundaries in common with Bulgaria and Greece; and Iran, Iraq, and Syria lie to the east and south.

Demarcation maps are not available for all of the boundaries. In some cases, several series of maps of uneven quality are required for adequate coverage. Some boundaries are completely described by treaties, protocols, or agreements but are plotted on old and inaccurate bases. The best medium- and large-scale maps of the land boundaries of Turkey have been selected and are discussed in this report on the basis of their relative merits.

GREECE

The boundary between Turkey and Greece is completely covered by an official boundary series at 1:25,000.

1. Carte de la Frontière Gréco-Turque; 1:25,000; Greek-Turkish Delimitation Commission of 1925-26; in French; marginal geographic coordinate divisions; CIA Call No. 24714.

This is a 10-sheet monochrome series that shows detail for a strip approximately 6 miles wide along the border. No printed index is available. The Greek-Bulgar boundary is not plotted on the map; it follows the

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right bank of the Maritza River and joins the Greek-Turkish and Bulgar-Turkish boundaries just north of the point 320A on Sheet 1.

BULGARIA

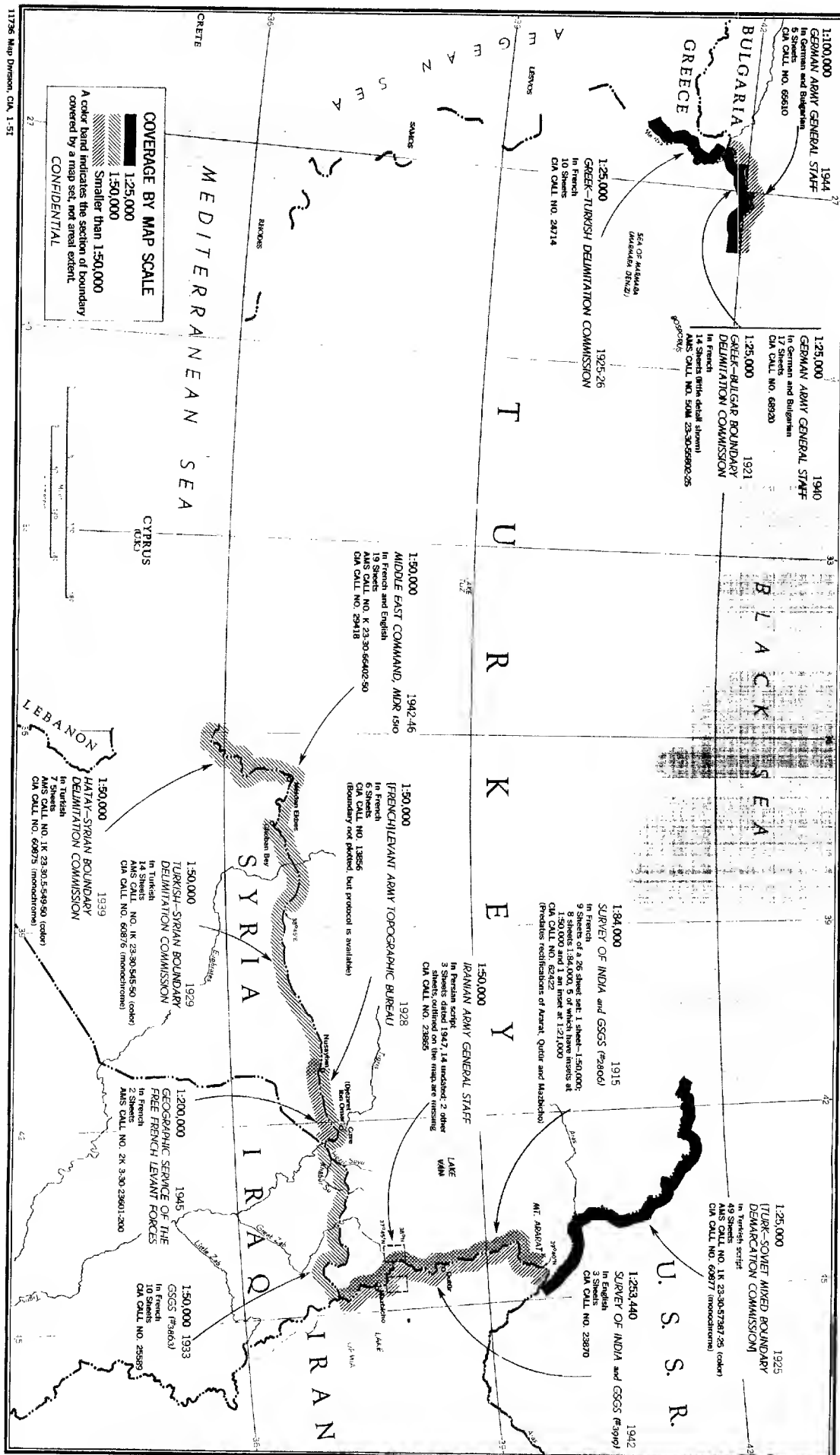
An official boundary series covers the area immediately adjacent to the frontier but gives so little supporting data that four other series are recommended. The very old map at 1:200,000, Item 2, which was used in writing the convention, agrees with the official 1921 boundary series. A series at 1:100,000 and two detailed series at 1:25,000 are more recent and accurate. On the three more recent sets, the boundary alignment differs slightly from that on the two older maps, but the alignment in relation to terrain, drainage, and population centers is shown consistently on all of the maps.

2. Austrian General Staff Map, 1:200,000; Vienna Cartographic Institute; reprints dated 1915 to 1936; in German; geographic coordinates with longitude based on Ferro; AMS Call No. 6 23-30.5-49005-200.

This is the official series used for boundary definition in the conventions of 1879, 1913, and 1915. The entire boundary is covered by sheets Midia (46° 42°), Burgaz (45° 42°), and Adrianopel (44° 42°). Although the maps are clear and detailed, boundary alignment is generalized. An index is available at AMS and in Notes on Maps of the Balkans, Directorate of Military Survey, War Office, London, 1944, Appendix H.

The maps agree with the conventions except in two areas. In the area between Hills 130 (41°49'29"N-26°32'25"E) and 253 (41°49'26"N-26°22'53"E), the convention signed at Sofia, 24 August 1915, states that the boundary "turns toward the west in a straight line," whereas on this series it dips

MAP COVERAGE OF TURKISH BOUNDARIES



slightly to the south in order to pass "south of Hadji-keuy and R. Sukun." This part of the boundary is not shown as a due east-west line even on the official boundary series, Item 6. On Items 3, 4, and 5, also, the boundary is not a due east-west line but is parallel to the northing lines of the military grid; this is probably a coincidence. Near the Turkish village of Rodoslavci, the boundary alignment on Item 2 agrees fairly well with the convention but differs from that on larger-scale maps for a distance of about 6 kilometers. Some of these discrepancies may be the result of changes made by the delimitation commissions.

3. Bulgarien 1:100,000; High Command, [German] Army General Staff; second edition, 1944; in German and Bulgarian, with three separate legends for features in Greece, Turkey, and Bulgaria, and a translation of each legend into German; marginal geographic coordinate divisions and military grid; CIA Call No. 65610.

For general use, this is the most convenient map because it is recent, multicolored, and legible. The boundary is completely covered on five sheets: VII 7, VII 8, VII 9, VIII 8, VIII 9. An index is generally available in Washington map libraries. Some of the place names in Greece and all those in Bulgaria have been romanized. Turkey is mapped in less detail than other countries, using blow-ups of the Turkish 1:200,000 maps.

4. Bulgaria 1:25,000; Bulgarian War Ministry, after National Geographical Institute, Sofia; 1936; in Bulgarian; marginal geographic coordinate divisions and military grid; CIA Call No. 24724.

This is a detailed, multicolor series, but no data for Turkey are plotted on it. The boundary is completely covered by 17 sheets numbered from west to east: 1951, 1907-09, 1865-1867, 1824-1828, and 1872-1876. Sheets 1866 and 1867 are missing from the CIA series.

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A printed index is generally available at map libraries. The series is not specifically a "boundary map" but is the most legible and nearly complete of the three detailed series recommended for the area of Bulgaria. It should be used in conjunction with the German series (Item 5).

5. Bulgarien 1:25,000; German Army General Staff, Division of War Maps and Surveying; 1940; in German and Bulgarian; marginal geographic coordinate divisions and military grid; CIA Call No. 68920.

This is an excellent monochrome copy of Bulgaria 1:25,000, with names of towns and many physical features romanized. The area of Turkey has been filled in from blow-ups of Greek maps at 1:100,000 and Bulgarian maps at 1:126,000, with corrections from smaller-scale maps. The series available includes sheets 1866 and 1867, which are missing from Item 4.

6. Turk-Bulgar Boundary; 1:25,000; Greek-Bulgar Boundary Delimitation Commission; 1921; in French, Sheet 10c in Russian; geographic coordinates, with longitude based on Paris; AMS Call No. 50M 23-30-55802-25.

According to the terms of the Treaty of Sevres of 10 August 1920, the present area of Turkey immediately south of the Turk-Bulgar boundary was ceded to Greece. The area was returned to Turkey by the Treaty of Lausanne of 24 July 1923. The present Turk-Bulgar boundary was demarcated by the Greek-Bulgar Boundary Delimitation Commission in 1921 and was confirmed as the authentic Turk-Bulgar boundary by the Treaty of Lausanne. The boundary is shown on 14 sheets of this series (1-C through 14-C). Alignment as given follows the old Austrian 1:200,000 series (Item 2) rather than the more recent Bulgarian and German maps (Items 4 and 5).

This series is superior to others because of the combination of its official character and clarity, but it is not as detailed as Items 4 or 5.

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Little is shown other than contours and the 320 numbered boundary cairns; in some places data are plotted for no more than 500 meters on each side of the boundary. On Sheet 4-C the longitude is marked 10' too far west. An index is included in the series.

USSR

The boundary is completely covered by only one map, a mediocre series in old Turkish (Arabic) script.

7. Turkish-Russian Border; 1:25,000; authority in doubt, index sheet gives Council of Peoples Commissariat of the SS Republics of the Caucasus; 1925; in Turkish script with place names romanized in manuscript; marginal geographic coordinate divisions; multicolor originals, AMS Call No. 1K 23-30-57387-25; photostat copies, CIA Call No. 60877.

The boundary is completely covered by the 49 sheets of this official boundary series, which is based on the field work of the Turk-Soviet mixed boundary demarcation commission. An index is available at AMS and CIA. Data are plotted for a strip about 2 miles wide along the border. The 450 boundary pillars are numbered, some in Turkish script. The southern end of the boundary is located at the confluence of the Ninji-Kara Su and Aras rivers, but this point is not included on the map and, consequently, the Turkish boundaries with Iran and the USSR appear to end about 175 yards apart. The maps are moderately clear and the lack of a legend sheet is not a great handicap.

Boundary alignment agrees with the detailed description in the protocol of the mixed Turkish-Soviet boundary demarcation commission signed 9 September 1926. As far as is known, this protocol is available in the

United States only as enclosure 2 to despatch No. 1813 of 27 August 1947 from the American Embassy, Ankara (CIA No. 110646).

IRAN

Three map series are necessary to cover the border adequately. The official boundary map (Item 8) is out of date and incomplete, and two sheets of the only up-to-date large-scale series are missing from the series available in Washington. The largest-scale map that shows the entire boundary correctly is the Quarter Inch Series (1:253,440).

Two of the well-known map series are not recommended. Neither is sufficiently detailed or accurate to permit more than a rough interpretation of the accords. The first, the 1:84,000 series issued by the General Staff of the Red Army, gives complete coverage. It is the source of the topographic data on Item 8, an official boundary series, but does not agree with it in all cases and is much less easy to read. The second, the Turkish 1:200,000 that covers all of the Iran boundary, is clearer and the sheets were revised more recently than the Quarter Inch Series (Item 10). Revisions, however, were limited to cultural features and the series carries fewer of the place names mentioned in the accords than does the Quarter Inch Series. On some sheets, no data for the area of Iran are plotted. The Mazbicho rectification area falls approximately at the edges of two adjacent sheets, but the boundaries do not match at the neat lines.

8. Frontière Turco-Persane; 1:21,000 to 1:84,000; Survey of India and Geographical Section, General Staff (GSGS 2806); 1915; in French; geographic coordinates; CIA Call No. 62422.

The complete series, which covers most of the Turkish-Persian boundary of 1915, consists of 26 sheets. The present Turkish-Iranian boundary is almost completely covered by nine sheets (numbered XVIII through XXV, and XXIIa), including five insets. The extreme northern part of the boundary north and east of $39^{\circ}40'N-44^{\circ}30'E$ is not covered. The sheets show 111 numbered cairns and considerable other detail for a strip approximately 5 miles wide on each side of the border. In spite of being out of date, the series provides the most detailed information available for about three-fourths of the present boundary. All 26 sheets of the set are indexed on CIA 10405.

9. [Iran; 1:50,000]; Geographic Division of the Iranian Army General Staff; 3 sheets dated 1947, 14 sheets undated; in Persian script, with some of the marginal information translated into English; geographic coordinates; CIA Call No. 23865.

Nineteen sheets are required to cover the Turkey-Iran boundary completely, but only 17 are available. The missing sheets cover the eastern and western parts of that portion of the boundary between $37^{\circ}45'N$ and $38^{\circ}00'N$. Rectifications in the Ararat, Qutūr, and Urmia (Rizāīyeh) sectors, which were agreed to in the Turkish-Iranian Accord of 1932, are incorporated on the map. It seems probable that the minor rectification in the Mazbicho sector ($37^{\circ}35'N-44^{\circ}39'30"E$), as given in the Turkish-Iranian agreement of May 1937, has been included, but this cannot be verified. For this sector, Sheet XIX of Frontière Turco-Persane (Item 8) is of value for orientation purposes.

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Use of two or three colors instead of monochrome would have made the series much easier to read. The sheet covering the junctions of the Ninji Kara Su and Aras rivers does not carry a boundary symbol.

An index as well as the entire series is available at AMS under Call No. 5K 3-30.5-25205-50.

10. Quarter Inch Series; 1:253,440; Survey of India and Geographical Section, General Staff, (GSGS 3919); second edition, 1942; Grid C and marginal geographic coordinate divisions; CIA Call No. 23870.

Three sheets (J-38 C, J-38 I, J-38 O) of this series cover all of the border and include the three rectifications of 1932. The rectification of 1937 is too small to be shown at this scale. (See Item 9.) Although the sheets carry a large amount of detail and comprise the only series showing the complete boundary correctly, the sheets themselves are not accurate. For instance, in a strip several miles long extending west from the boundary at 37°37'N, it was impossible to adjust the topographic data.

IRAQ

The boundary is covered completely by an official demarcation series.

11. Frontière Turco-Irakienne; 1:50,000; British Geographical Section, General Staff (GSGS 3863); 1933; in French, with English equivalents of place-name spellings on four sheets; geographic coordinates; CIA Call No. 25589.

Ten sheets cover the Turkey-Iraq boundary, and each sheet carries a complete index. Information is detailed but is plotted for a strip only about four miles wide on each side of the boundary. The 99 numbered cairns are located on Sheets 2 to 10, inclusive; throughout Sheet 1, the boundary follows the Habur and Hezil rivers. Although not so stated, the

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map embodies the work of the demarcation commission during March-September 1927. This frontier is discussed in League of Nations Publication C.400.M.147.1925.VII, which includes 11 maps that show physical, economic, and ethnographic features.

SYRIA

Five sets are cited for coverage of the Turkey-Syria boundary. The pre-1939 boundary was defined by a convention of 30 May 1926 and by a protocol of 22 June 1929 according to three sectors: (1) Mediterranean to Choban Bey; (2) Choban Bey to Nusaybin; and (3) Nusaybin to the Tigris River. In the first sector, the boundary was changed by the establishment of the autonomous Sanjak of Alexandretta (20 May 1937) and its later incorporation into Turkey as the vilayet of Hatay (23 June 1939). An unofficial series at 1:50,000 shows the boundary from Choban Bey westward to the Mediterranean Sea and supplements the official boundary set at 1:50,000 covering Hatay. There are official boundary series at 1:50,000 for the entire second and third sectors, but the series available in Washington that covers the Tigris-Nusaybin sector has no boundary plotted on it. For this sector, the largest-scale boundary coverage is at the scale of 1:200,000.

12. Carte au 1:50,000 du 3^{ème} Secteur de la frontière Turco-Syrienne de Nissibin à Djéziret ibn Omar; /French/ Levant Army Topographic Bureau; 1928; in French; unnumbered grid; CIA Call No. 13856.

The map is printed in six sheets but indexed on each sheet as a seven-sheet series. In printing, Sheets Nissibin and Kertouin, which

cover the area from $41^{\circ}05'E$ to $41^{\circ}24'49"E$, were combined. A Turkish-French boundary commission checked the maps in the field in 1927, and the maps were probably used in preparing the final protocol describing this sector, signed at Ankara 22 June 1929, but the boundary line is not plotted on the series available in Washington. Within scale limitations, all the places mentioned in the protocol can be found on the maps. The protocol is available in L'Europe Nouvelle, 12th year, No. 602, 24 August 1929, pp. 1143-1144, LC Call No. AP 20 E88.

13. Levant 1:200,000; Geographic Service of the Free French Levant Forces; November 1945; in French; geographic coordinates in grads, Caucasus grid; AMS Call No. 2K 3-30-23601-200.

Sheets Qamichliye Sinnjar and Qaratchok Darh completely cover the third sector, Nusaybin-Tigris. Since Item 12 carries no boundary, these two sheets provide the largest-scale coverage on which the boundary of the third sector is plotted.

14. Türkiye-Suriye Hududunun, 2 Inci Kismi, Cobanbey-Nusaybin; (Turkish-Syrian Boundary, Second Sector, Choban Bey-Nusaybin); 1:50,000; Turkish-Syrian Boundary Delimitation Commission; April 1929; in Turkish; no grid or coordinates; multicolor originals, AMS Call No. 1K 23-30-545-50; photostat copies, CIA Call No. 60876.

Fourteen sheets of this series cover the second sector of the boundary. The sheets are numbered from west to east and are indexed roughly on Sheet 3. In the vicinity of 14 railroad stations, the boundary and railroad tracks are shown on insets at a larger scale. The 219 points plotted along the boundary have numbers between 481 and 1221.

15. Hatay-Suriye Hududu (Hatay-Syrian Boundary); 1:50,000; Hatay-Syrian Boundary Delimitation Commission and Turkish General Map Directorate; April 1939; in Turkish; military grid; multicolor originals, AMS Call No. 1K 23-30.5-549-50; photostat copies, CIA Call No. 60875.

The entire Hatay boundary is covered by seven sheets, five of which carry an index. Information is plotted for only a narrow strip up to 2 kilometers in width on each side of the border and cairns numbered 1 to 462 are located, but the alignment of the boundary between Sheets IV and V does not match. In general, alignment agrees well with that on the Levant 1:50,000 series (Item 16). The provisions of the French-Turkish agreement of 23 June 1939, rectifying the Hatay boundary in three places, have been incorporated on both sets, but the sets differ on the location of cairns 235-281 and 285-287.

16. Levant 1:50,000; British Middle East Command (MDR 1510); 1942-46; in French and English; Levant Lambert grid and marginal geographic coordinate divisions; CIA Call No. 29418; AMS Call No. K 23-30-66402-50.

The Turkish-Syrian border west of 38°45'E is completely covered by 19 sheets of this set. It is the only large-scale coverage of the border between Choban Bey and Meidan Ekbes (Sheets Tchobane Bey, Aazaz, Aafrine, Bulbul, and Meidane Ekbes). The longitude lines on some copies of the Aazaz sheet are numbered 15' too far east. Part of the area of Turkey has been left blank on the map. Indexes of the set are available at CIA and AMS.

II. THE INTER-AMERICAN GEODETIC SURVEY

The establishing of geodetic control for Latin America, an area 6,000 miles in length and in places as much as 3,000 miles in width, is an enormous task. Yet this is the task that was undertaken five years ago by the Inter-American Geodetic Survey (IAGS) -- an organization established in 1946 to fulfill one of the basic requirements in the solution of some of the mapping problems facing Latin America.

The lack of adequate maps had long been a serious handicap in the settlement of political disputes and in the economic development of the 20 republics to the south. However, the strategic requirements of World War II brought into dramatic focus--- from a hemispheric point of view -- the need for accurate knowledge of where things were. Where, precisely, were deposits of strategic minerals located? Over what kind of terrain did they have to be transported? Were there mountains to avoid, rivers to cross, towns with manpower available to expedite exploitation? What military approaches and defense sites were of immediate concern? Countless questions of this kind emphasized the fact that maps were few in number and that throughout Latin America facilities for producing more or better maps were limited. It was estimated recently that one of the South American government agencies responsible for the official mapping of its country would require 250 years to complete a map series on which it had already worked for more than 30 years, provided no changes were made in the size of its staff or budget. In many countries no facilities were

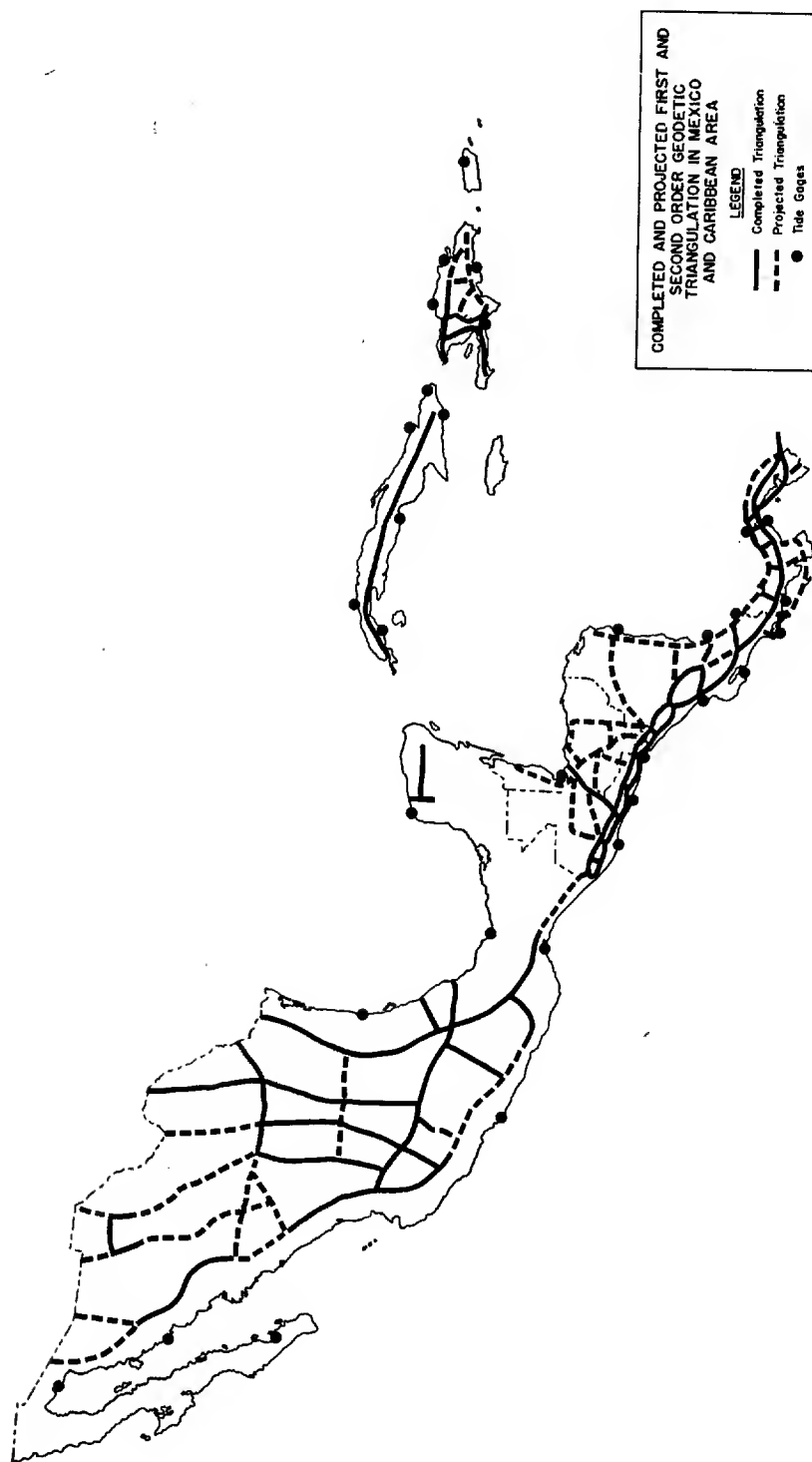


Figure 1

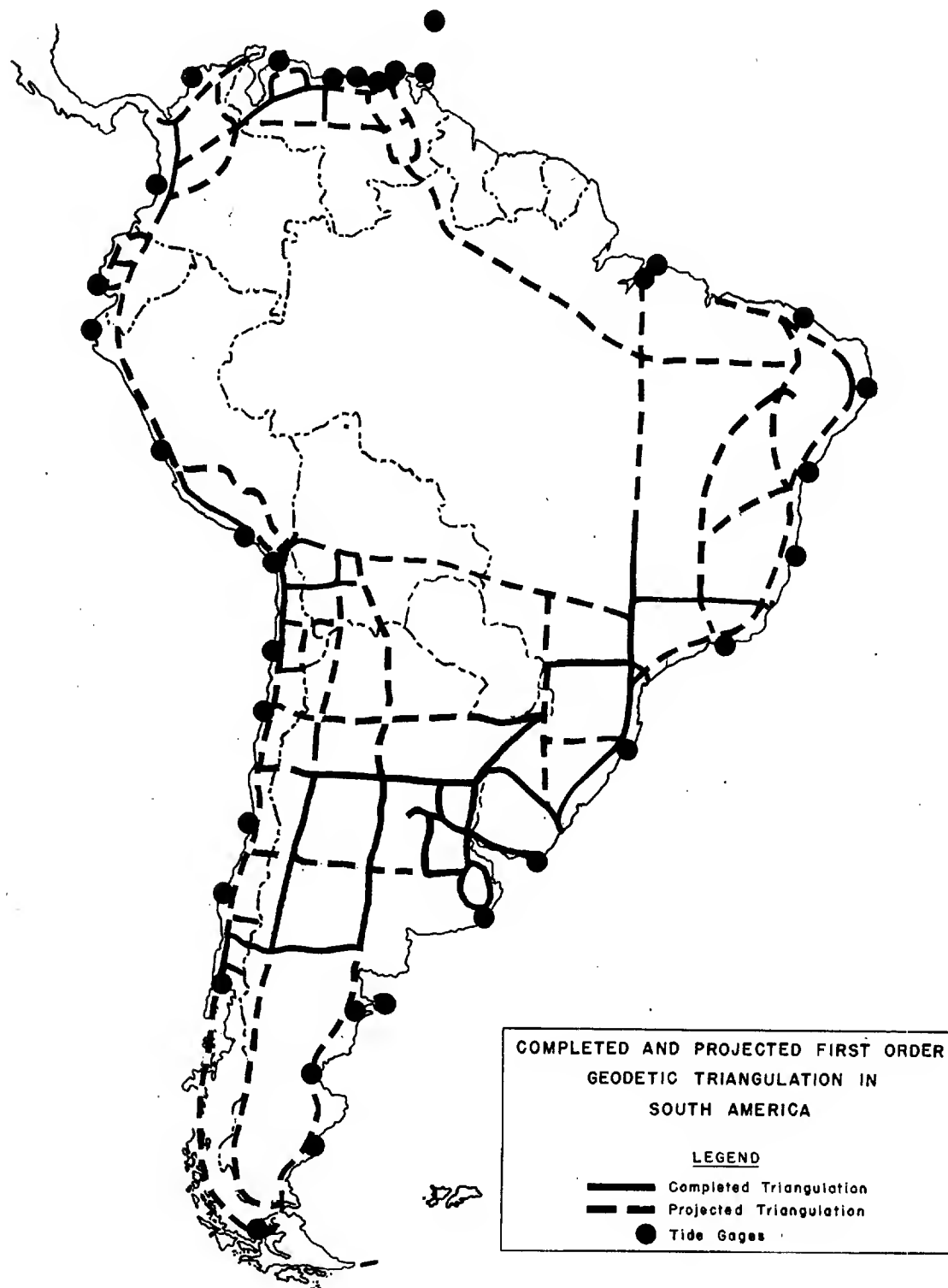


Figure 2

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available for training new technicians. Cartographic dilemmas of this sort had been studied by the Pan American Institute of Geography and History (PAIGH) and had contributed to the establishment of its Cartography Commission -- an organization set up to stimulate surveying and mapping activities in each of the American Republics according to its individual mapping needs and following established international standards. However, not until 1946 did one of the member nations of the PAIGH set up an active, operating unit that could collaborate with other nations in achieving part of the over-all purposes of the Cartography Commission. At that time, the IAGS was established by the United States Department of Defense to implement a mapping and charting plan for Central and South America, and a definite long-range program was inaugurated.

Scope of Activities

By broadest definition, it is within the scope of the IAGS to tie together into a single integrated mapping effort all of the independent national programs that had existed previously. The numerous datums that had been established throughout Latin America not only required a tremendous amount of mathematical adjustment but also called for expenditures of effort and funds that would be greatly reduced in a coordinated program. The clearly recognized advantages to be gained from a datum of high and uniform accuracy for all of Latin America were (1) the establishment of continuous triangulation arcs across international boundaries as a result of collaborative endeavor -- an essential feature of the program and one that would be impossible to achieve otherwise; (2) the creation of a

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sound foundation for all subsequent geodetic and topographic surveying, ultimately expediting the mapping programs of each country and of the area as a whole; and (3) the introduction of uniform geodetic control values for the entire Western Hemisphere complex through the adjustment of the new South American Datum to the already existing North American Datum.

Currently IAGS activities include only first-order work, but some second-order triangulation has already been completed in Central America. There is a move at present, as the first-order work is completed, for the IAGS to assist the local agencies in undertaking lower-order control as well as in photomapping and map reproduction within the individual countries. Momentum could thus be gained toward making the "end product" become a reality.

Negotiations

The negotiation of agreements with the individual countries throughout Latin America was a major problem in the early days of the IAGS. With the aid of the diplomatic channels of the Department of State, however, a series of bilateral agreements has been successfully executed. To date, diplomatic agreements have been signed, or operations based on informal agreements are in progress in 17 countries. Negotiations are underway with Uruguay, Paraguay, and Argentina. In the case of Mexico, a diplomatic agreement was not signed because a program of limited cooperation in geodetic work has been cleared through the long-standing Joint US-Mexican Military Commission. Informal working arrangements with Chile and Brazil

have been in force for about three years, and extensive effort, funds, and equipment have already been expended in these countries. The Brazilian problem is great because of the size of the country (estimated as one-sixth larger than the US), and the length of the triangulation arcs required. The work in Brazil alone is a large portion of the entire Latin American program.

Agreements have also been established with the home governments of the British, French, and Netherlands territories in Central and South America, but no programs have been initiated in any of them, principally because priority has been given to countries to which no other aid is available.

The negotiations have been general in nature, leaving details of the program to be worked out by the personnel concerned. In every country a specific agency is named to collaborate with the IAGS, and that agency is responsible for any coordination required within its own government. Several countries had no governmental cartographic agency prior to the signing of the agreements, but in all of these (except Panama) some sort of cartographic institute has subsequently been established to carry out the necessary collaboration. It is significant that in every country in which the IAGS has worked, government appropriations for cartographic work have been increased, in some cases as much as tenfold since 1945. Although there are extreme variations in appropriations from country to country, the total Latin American contribution, computed on a dollar basis, is three to four times that of the United States.

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Organizational Framework

The IAGS was created in 1946 to carry out the US Army's responsibilities in the "Caribbean, Central, and South American Mapping and Charting Program." This program, established by a directive of the Joint Chiefs of Staff, implemented the broader objectives of JCS Memoranda of Policy, Nos. 60 and 65, which respectively outline the coordination activities of the US Government in photographic and cartographic programs and the allocations of responsibilities among the military services. Although the JCS monitors the IAGS program, all directives resulting from the evolution or processing of policy are channeled through the Map and Photo Branch, G-2, of the Army. Responsibility for the over-all program is delegated to the Caribbean Command, which maintains liaison for technical support with the Office of the Chief of Engineers. IAGS Headquarters are in Panama, under the US Army, Caribbean (the army element of the Caribbean Command), and all technical personnel are ground-surveying forces. Of these, 26 are Army officers and 266 are civilians, the majority of whom are assigned to one of the 17 Project Headquarters located in an appropriate city in each of the countries participating.

A typical Project Headquarters has an Officer-in-Charge, a secretary, a supply clerk, a chief geodetic engineer, and two or more junior geodetic engineers. This pattern varies, however, from place to place, depending upon local requirements and support. Each Project Headquarters also maintains military vehicles, radios, and surveying equipment, which are lent to the local government for work previously agreed upon. To provide aid where

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needed in the work carried on by each Project Headquarters, there is a Field Operations Division based in Panama. Its branches -- Training, Vertical Control, Horizontal Control, Data Collection, Photomapping, Geophysical, and Engineer Services -- are completely equipped. In the event that some particular operation is beyond the capabilities of the collaborative effort between any Project Headquarters and the local government, the appropriate task force from the Operations Division can be sent in to complete the work.

Air support for ground forces and aerial photography are provided by the USAF, usually through the Caribbean Air Command (CAirC) -- the air arm of the Caribbean Command. Currently, no aerial photography is being flown by the CAirC because of the removal of its photographic component, but light aircraft are still being used to carry supplies and personnel to areas most difficult to reach on the ground. Helicopters, which were available for a short time, proved especially valuable, and it is hoped their use can be resumed at a later date. The naval component of the Caribbean Command cooperates fully in coordinating naval aerial photography and, on occasion, Hydrographic Office surveys. Three Coast and Geodetic Survey officers lent to the program as technical consultants have proved invaluable.

Accomplishments

The advances made by the program during the past five years are notable, especially in view of the many handicaps that arose at every step along the way. The basic first-order triangulation arc will be almost 20,000 miles long, not counting the many secondary arcs. Figures 1 and 2 show the completed

and projected first- and second-order geodetic triangulation networks (as of mid-1950) for all of Latin America, including areas where IAGS agreements are still pending. To date, first-order control along the main north-south arc has been completed throughout Central America and as far south as Turbo, Colombia. Additional chains of the national networks within El Salvador, Costa Rica, and Nicaragua have been completed. National networks in other countries are being extended; those in Honduras will be completed in July and in Panama in August. A small sector in Guatemala will be completed soon, coincident with the adjustment of the entire network to the already established control in Mexico. At that time, the completed Central American arc will become the southernmost extension of the North American Datum. IAGS has recently set up an office in Mexico City.

First-order triangulation in Cuba is completed; in the Dominican Republic it will be finished during 1951. IAGS operations in Haiti are nearly complete, and the Haitian government is filling in the second- and third-order stations.

The main arc of triangulation will be complete as far south as the northern boundary of Ecuador by July 1951. The same completion date is estimated for the stretch between Lima and the Chilean border. By July 1952, the entire arc from Mexico to southern Chile will probably be filled in, as well as the transcontinental arc which crosses Bolivia and Brazil. The latter is now completed from the main west coast arc as far east as central Bolivia, and is currently being continued by the Corumbá project to connect eventually with Brazilian surveying which is being extended westward. The Venezuelan

section of the main arc through northern South America will be tied to the Colombian network in the fiscal year 1952.

All of the varied aspects of ground control have been a major part of the program from the outset. To date, 77 base lines have been measured. The basic astronomic determinations have been completed for the Caribbean and Central American areas, and work is in progress in South America. Thus far, 104 astronomical and La Place azimuth stations have been established. Sixty-three tide gauges are being operated, from which data are being collected to establish the mean sea level datum for Latin American. Tide gauge stations are located at intervals along the entire Central and South American coast and through the Antilles. Magnetic surveying continues to be conducted by IAGS personnel; 88 stations have been observed, the data being submitted to the Coast and Geodetic Survey for computation. An extensive gravimetric survey is currently being undertaken on the plains of Central Venezuela from which to adjust the deflection of the vertical at the proposed point of origin for the South American Datum, so that it may be positioned correctly on the face of the geoid. Other surveys of this type may possibly be conducted later in Brazil and Argentina in order best to determine the final point of origin.

A training program located in Panama is now an integral part of the IAGS operations and provides all new technical personnel with essential geodetic training.

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Problems

The problems encountered in a program of the magnitude of that undertaken by the IAGS are necessarily great and varied. Many administrative and logistic problems that were an inherent part of the program have been effectively solved. In some countries, the refusal of free entry of essential equipment through Customs has interfered with progress. Diplomatic involvements have not been the least of the complications encountered.

Two primary difficulties of outstanding significance to the entire operation have been and still are of major concern:

1. Lack of trained personnel -- Qualified geodetic personnel are in constant demand and are in extremely short supply. At present a full complement is at work, but the rigorous work requirements make the life far from easy and, justifiably, frequent replacements are needed.
2. Lack of aerial photography -- Original plans by the Caribbean Command for extensive aerial photography have been drastically curtailed. The agreement to provide prints to the countries photographed was a most persuasive factor during preliminary negotiations, and the obligation to fulfill this mission rests with the US Government. No time limit was set, however, and progress has been slow. As ground control progresses, the lack of aerial photography presents an increasing problem, since in many areas a return trip will be required in order to identify points on aerial photographs when they become available.

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One of the obvious difficulties in carrying out the IAGS program is the nature of the country being surveyed. From Mexico to Tierra del Fuego, nearly every type of climatic and vegetative zone is encountered, and some IAGS engineer must make his way through each to observe, measure, and identify required locations. Adverse publicity from the Communist press in various areas does not mention that the "American imperialists" often sleep in hammocks under mosquito netting or fight stiff winds and altitude sickness for days in the Andean wastes (some triangulation stations are as high as 18,000 feet) in order to procure exact data that will contribute to the ultimate improvement of the cartography of the country being surveyed.

Plans

Various estimates have been made as to the time required to complete the IAGS program. When first undertaken, 20 years was estimated for completion. Within two or three more years, ground control will probably be well in hand for all areas in Central America and western South America, but the projected areas of activity in Argentina, Uruguay, Paraguay, and Brazil cover hundreds of thousands of square miles, and exact plans for their control have not yet been completed.

Aerial photography by the Caribbean Command is currently at a standstill. It is estimated that five-years' intensive work could provide adequate photography if men and equipment sufficient to do the job were reassigned to the Caribbean Command. Strategic Reconnaissance Units (Strategic Air Command) of high-altitude photographic aircraft, recently stationed in Puerto Rico, are expected to accomplish a portion of the required aerial photography on training

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missions in the near future. Some contract aerial photography is being flown for the Army in areas of vital military importance. An essential feature of the future collaborative operations with the Latin American governments will be the advising (and sometimes equipping) of local aerial photographic agencies, with the hope that much of the photography may be accomplished in this manner and that self-sufficiency in this respect will ultimately be attained.

The program as it now stands has made remarkable progress. It is currently being revised, both as to areas to be covered and scope of activities, and it is hoped that the program can be broadened into a more balanced cartographic endeavor instead of a plan primarily for data collection, which it has been thus far. An ultimate objective of the program is the creation of cartographic self-sufficiency within all Latin American countries, all using standard methods and equipment and supplying the results of their efforts to the United States.

The success of the cooperation and collaboration between the IAGS personnel and the foreign agencies with which they have worked is an outstanding example of progress made possible by nations working together to achieve a common purpose. The consolidation of Latin American mapping data may well be the cornerstone for a Western Hemisphere solidarity which will be of immeasurable value in an expanding peacetime economy or in a unified defense in the event of war.

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III. THE ISRAEL-JORDAN YARMUK RESERVOIR

AREA BOUNDARY DISPUTE

A. Introduction

The Israel-Jordan Yarmūk Reservoir area boundary dispute provides an excellent example of the misuse of maps in conjunction with an international agreement. On the basis of a line drawn on a map,¹ Israel on 28 August 1950 occupied an estimated 40 acres between the Jordan River and the Yarmūk Reservoir and claimed part of the reservoir itself (see accompanying map CIA 11817). Although the forces were later withdrawn, Israel still claims the area, and Jordan filed a protest with the United Nations on 12 September 1950. This article emphasizes map aspects that are an integral part of the dispute.

The Yarmūk Reservoir is located on El Yarmūk River near the point where it enters the Jordan River. Waters of the reservoir were used by the Rutenberg hydroelectric plant, which was formerly one of the most important in the Palestine-Jordan region. Although now out of commission, it is potentially important in future programs of hydroelectric development in the region.

1. United Nations Map No. 200.1-X, May 1949, attached as Annex 1, Map 1, to Part 1 of the Hashemite Jordan Kingdom-Israeli General Armistice Agreement concluded at Rhodes on 3 April 1949. The base for this map is the North sheet of Palestine, 1:250,000, December 1946, reprinted by the Middle East Command from negatives supplied by Survey of Palestine. Hereafter in this article the UN map will be referred to as "the 1:250,000 map signed at Rhodes."

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B. History of the Dispute

1. Pre-Armistice: 1922-48

Insofar as this particular dispute is concerned, the Yarmūk Reservoir area is roughly defined as being within Jordan by Part 2 of a British Memorandum approved by the Council of the League of Nations.¹ The boundary between Palestine and Transjordan (now Jordan) was defined as extending up the Jordan River to its junction with El Yarmūk River, thence up the Yarmūk to the Syrian frontier.

From 1922 until the outbreak of hostilities in Palestine in 1948, there seems to have been no question that the Yarmūk Reservoir area now in dispute was part of Jordan; the international boundary in the disputed area was accepted. The Palestine conflict, however, produced rival claims regarding control of the Yarmūk Reservoir area. Jordan claimed that her ally, Iraq, occupied the area around the Yarmūk Reservoir. Israel claimed control over part of the area on the basis of a truce line established by the United Nations in August 1948. The line, however, left the southern part of the disputed area as a "no man's land."

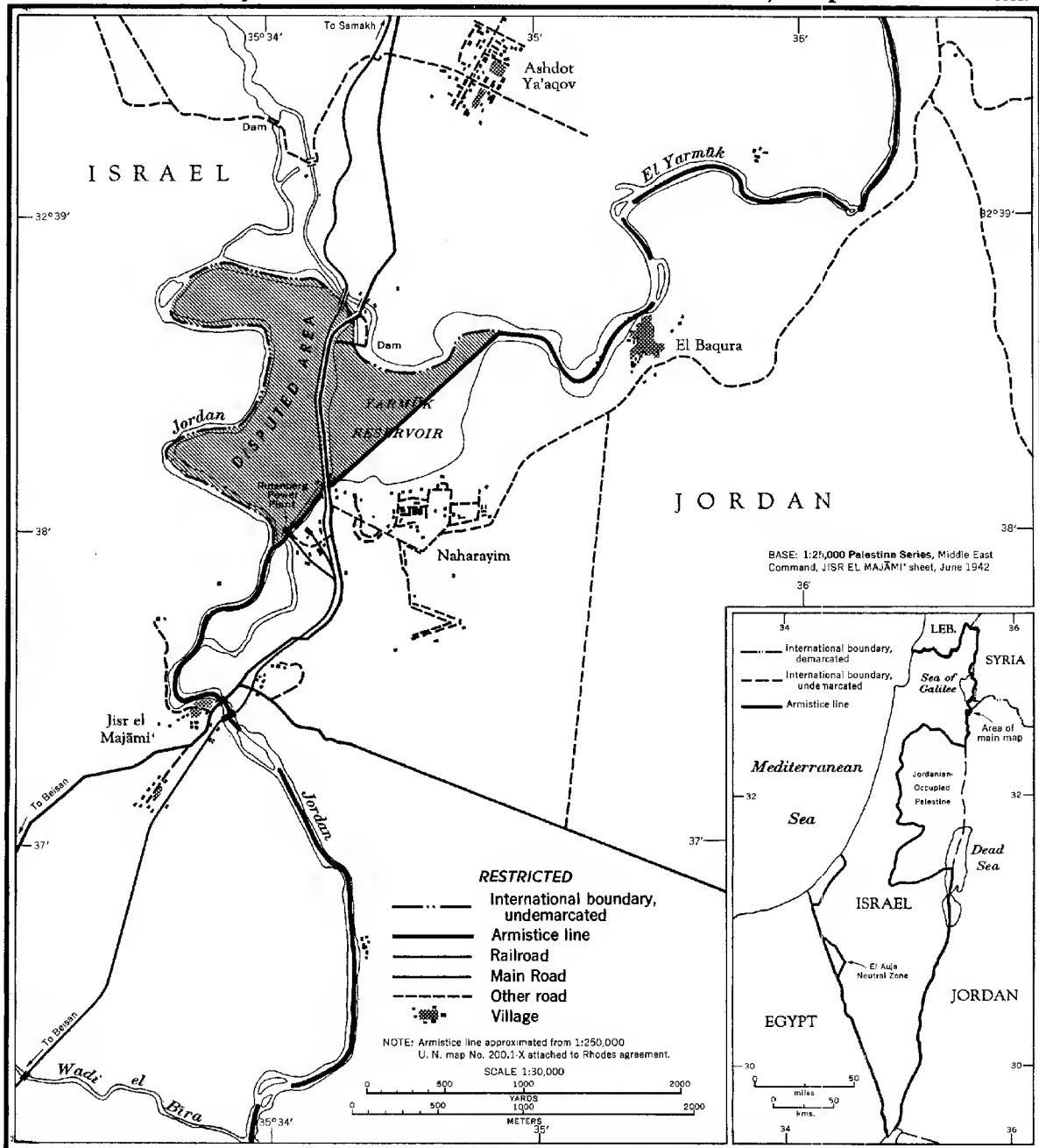
2. Armistice Negotiations: 1949

Armistice negotiations between Israel and Jordan were held at Rhodes in the spring of 1949 under the auspices of the United Nations Acting

1. Memorandum by the British Representative approved by the Council of the League of Nations in a note by the Secretary General, Geneva, 23 September 1922. British and Foreign State Papers 1922, London, 1925, Vol. CXVI, p. 849.

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RESTRICTED Israel-Jordan: Yarmūk Reservoir Area Boundary Dispute

11817

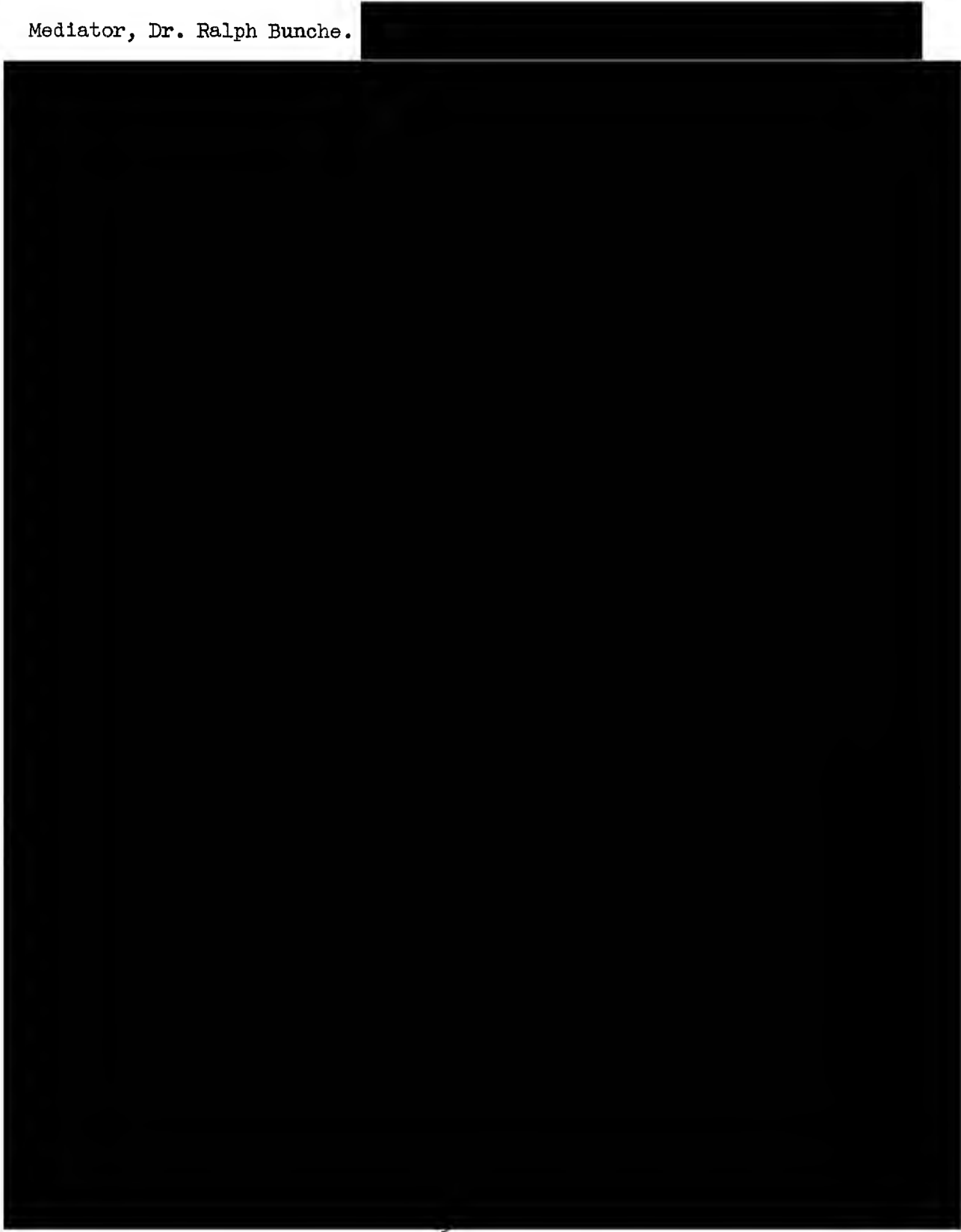


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CIA Reproduction

Mediator, Dr. Ralph Bunche.



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Upon the resumption of negotiations at Rhodes, an armistice agreement between Israel and Jordan emerged.¹ Among other provisions, the agreement defined lines within which each country was to maintain its military forces. Article II specifically states

. . . that no military or political advantage should be gained under the truce . . . [and that] no provision of this agreement shall in any way prejudice the rights, claims and positions of either party hereto in the ultimate peaceful settlement of the Palestine question²

According to Article VI,

The Armistice Demarcation Lines defined . . . are agreed upon by the parties without prejudice to future territorial settlements or boundary lines or to claims of either party relating thereto.³

The armistice agreement did not specifically define in words the armistice line in the Yarmūk Reservoir area, but Article VI, Part 2, did define it as the line delineated on Map 1, Annex 1, attached to the agreement (the 1:250,000 map signed at Rhodes).⁴

The 1:250,000 Rhodes armistice map, which was signed by Israeli and Jordanian representatives, is a direct point of dispute. The armistice line shown on this map extends northward along the Jordan

1. Hashemite Jordan Kingdom-Israeli General Armistice Agreement, US Department of State, Documents & State Papers, May 1949, Washington, D. C., 1949, Vol. 1, No. 14, pp. 806-809. This agreement is also contained in UN Document S/1302/, as corrected, 21 April 1949.

2. Ibid., Article II, p. 807.

3. Ibid., Article VI, Part 9, p. 808.

4. Ibid., Article VI, Part 2, p. 807.

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to a point southwest of the reservoir and thence northeastward across the reservoir to El Yarmūk River, thus placing the 40 disputed acres within Israeli territory. The circumstances surrounding the emergence of the Rhodes map are the subject of many conflicting claims.

the question arises as to what source the United Nations

cartographers used for depicting the armistice line from the point at which it joined the Jordan south of the Yarmūk Reservoir, through the reservoir, to El Yarmūk River. The Rhodes armistice line apparently follows the truce line established by the United Nations in August 1948. At any rate, both the scale and cartographic techniques used were most unfortunate choices. An examination of the 1:250,000 map signed at Rhodes reveals the following:

a. The scale is entirely too small for portraying the boundary in small strategic areas such as the disputed reservoir area. Only the

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most discerning eye could catch the distinctions in area control made by the armistice line drawn on the 1:250,000 map. It would be quite possible for someone to miss the significance of this line for small areas.

b. The representation of the armistice line itself is unnecessarily wide, especially for the delineation of control over small areas. For example, the line practically covers the entire Yarmūk Reservoir.

C. Contentions of Israel and Jordan

Jordan claims that only Palestinian territory was involved in the Rhodes armistice negotiations; consequently Jordanian delegates at the negotiation were not empowered to give away any of the territory of Jordan. As the basis of this contention, Jordan cites the fact that its frontier, as defined roughly in 1922, included the Yarmūk Reservoir area. Some Jordanians claimed that the Rhodes 1:250,000 map was a forgery and that Jordanian negotiators were the victims of a fraud. This claim has not been pressed, however.

Israel, on the other hand, claims that Jordanian territory was a subject of negotiation.¹ As the main basis of its action in occupying the Yarmūk Reservoir area, Israel cites the line on the 1:250,000 map attached to the armistice agreement at Rhodes. Israel has not questioned the fact that the disputed area was originally part of Jordan.

1. Army Attache Israel R-409-50, 3 November 1950 (Confidential). Reference is made to the testimony of Colonel Harkabi, Senior Israeli Mixed Armistice Commission representative, which appears on page 3 of the document.

The UN Acting Mediator was under the impression that the official armistice negotiation had intended to discuss only Palestinian territory, 25X6

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[REDACTED] Jordan, he thought, had made a mistake in signing the disputed 1:250,000 map attached to the agreement at Rhodes, having been outbargained by the Israeli negotiators instead of being the victim of a fraudulent plot.¹

Although the armistice agreement provided that the armistice demarcation lines were not to be construed as definitive boundaries, such lines have, in fact, taken on the character of boundaries. For example, Jordan formally annexed that portion of Arab Palestine adjacent to the Jordan River, and Israel, in turn, informed the Palestine Conciliation Commission on 27 October 1949 that it claimed title to all territory then under Israeli control.² The Israeli statement antedated the Israeli occupation of the Yarmūk Reservoir disputed area but presumably would apply to it also. The Master Plate at the scale of 1:250,000 attached to the Second Interim Report on Master Plan for Development of Irrigation and Hydroelectric Power in State of Israel, Vol. 1, October 1950, indicates that Israel already has plans to control the entire Yarmūk Reservoir.³

1. A 16 October 13, 1950, to Jerusalem (Secret).
 2. Prospects of Territorial Expansion by Israel, OIR Report No. 5218, Department of State, Office of Intelligence Research, 12 January 1951, p. 8 (Secret).
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D. Conclusions

This boundary dispute presents many legal and political issues outside the scope of this article. The map attached to the armistice agreement has become the nominal cause of the dispute. Since the text of the armistice agreement did not describe in detail the armistice line in the Yarmuk Reservoir area but relied entirely upon the attached map as the definitive part of the document, it would seem to have been imperative that the base map and cartographic techniques used should be adequate for delineation purposes. Larger scale maps (1:25,000 Palestine series) could have been used and greater care exercised in the insertion of the lines on the map.

IV. UNUSUAL TERRITORIAL-ADMINISTRATIVE

CHANGES IN THE TADZHIK SSR

A number of changes in the territorial-administrative organization of the Tadzhik SSR were announced during the second half of 1950. Although most of them were at village (kishlak) and rayon levels,¹ two were at oblast level. In Garm Oblast, the new oblast city of Novabad (39°04'N, 70°12'E) was created and the administration of the Oblast was shifted from the long-established center at Garm (39°03'N, 70°22'E) to the newly-designated city about 10 miles farther west.

Novabad is the only "city"² in Garm Oblast and is one of eight in the entire Tadzhik SSR. The building of the city was initiated in 1949 on the site of the "village" Shul'mak, the administrative center of Shul'mak Rayon. In July 1950, it was decreed a city directly subordinate to the Oblast and its name changed to Novabad, which means "new city." The transfer of the Oblast government from Garm to Novabad was announced in December 1950. Thus, within less than 2 years, the city was built, elevated to the rank of oblast city, and designated as the Oblast center.

1. The rayon changes were made in two widely separated areas, and indicate no general trend in economic development.

2. The legal definition of a city as established in the Tadzhik SSR is not known. It may be the same as in the RSFSR, where a city is a settlement having an adult population of not less than 1,000, of whom no more than 25 percent are engaged in rural pursuits.

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The other changes, which occurred chiefly in the two oblasts immediately to the west of Garm Oblast, were apparently made to further the centralization of administrative authority by reducing the number of village councils. Nine village councils near the northeastern boundary of Stalinabad Oblast were abolished, the lands of three of them being transferred to the State Land Fund. Six village councils in the Kulyab Oblast were abolished.

Since Soviet announcements rarely give the reasons for such changes, only speculation on the subject is possible at this time. The rapid transformation of a rural mountain village of Shul'mak into the oblast city of Novabad (without the customary progression through the rayon level), and its elevation to the rank of Oblast center suggests the presence of some economic activity that would warrant further investigation.

The principal rural activities of the Tadzhik SSR as a whole are agriculture and animal husbandry; the nonrural include mining, textile manufacture, food processing, and the production of consumer goods for local consumption. Of these, the main industry of "republic significance" is mining, chiefly nonferrous metals and fuels. In the past these included gold, uranium, wolfram, molybdenum, lead, copper, coal, and petroleum. In addition, the Soviet postwar Five-Year Plan specifically called for the exploitation within the Tadzhik SSR of tin and tungsten trioxide, as well as for large-scale exploration and surveying of coal, tungsten, antimony, and mercury deposits.

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Information on the extent of mineral reserves and mining within Garm Oblast is not specific. Just before World War II, however, the Oblast is known to have produced molybdenum, copper, arsenic, coal, asbestos, and salt. Furthermore, the general region within which the territorial-administrative changes have been made was described in a 1947 Soviet source as having geologic formations that would justify prospecting for "tin, berilium, lithium, rubidium, cesium, zircon, titanium, etc." In view of the increased interest in minerals, the unusual administrative changes in Garm Oblast could reflect a substantial expansion in mining and perhaps in the concentration of nonferrous ores. The increased centralization of authority in the adjacent oblasts of Stalinabad and Kulyab could also be a part of this same regional economic expansion.

V. BRIEF NOTICES

A. An Aerial Survey of Thailand

In December 1950, the Thai Government contracted with a commercial firm for aerial mapping surveys of part of the country. The British firm of Hunting Air Surveys, which was awarded the contract, had a plane in Thailand by the end of December and was ready to undertake the survey of an area 100 miles long by 60 miles wide in the eastern part of the country near Nakhon Ratchashima (Khorat). Since the most favorable weather for aerial photography occurs in January and February at the height of the dry season, most of the area may now be photographed. Information as to the character of the survey is fragmentary but indicates that the photography was to be flown at an altitude of 19,000 feet above mean terrain, with a forward overlap of 60 percent; no information is available regarding the focal length of the cameras.

Aerial photography for most of Thailand was flown by the RAF out of Malaya in 1945, 1946, and 1947. Although the Thai Government now has copies of this photography, the British have retained the original negatives. The lack of adequate ground control has precluded use of the photography for mapping.

The Thai Royal Survey Department is believed to have a field staff capable of undertaking the ground surveys for the area involved in the new contract, and it therefore seems likely that completed maps are to be prepared.

B. Soviet Map of a Coastal Area of Norway

A photostatic copy of a new map produced by the USSR from readily available Norwegian sources is now on file at the CIA Map Library (Call No. 71632-R). The map might be usable for landings or for submarine navigation and is the first known example of what appears to be a landing map prepared by the Soviets. It is not known whether this is a separate map or one of a series, nor can the originating agency be determined since only half of the sheet is available.

The particular Soviet sheet is at 1:100,000 and covers portions of the islands of Seiland and Kvalbø and part of the mainland just south of Hammerfest, Norway. It is a composite of the Norwegian topographic map at 1:100,000 (Hammerfest and Rolfsø Sheets) and a Norwegian hydrographic chart at 1:50,000 (No. 98, Den Norske Kyst -- Söröysund og Vargsund til Hammerfest). Where the two sources do not agree, the hydrographic chart has been followed. No additional data were added to those taken from the Norwegian sources.

Evidence available at present is insufficient to establish definitely the relationship between recent map purchases and compilation of large-scale maps by the Soviets. In Norway and Sweden, purchases have been made in such quantities or in such a furtive manner as to cause considerable concern in both countries. Newspaper reports indicate that in early 1948 the Russians purchased between 400 and 500 map sheets of Norway, including detailed coverage of the entire coastal and border areas. A Polish Military Attache' stationed in Stockholm is also reported to have

bought a great number of maps of Norway and Sweden at scales of 1:100,000 and 1:200,000 in November 1950 and attempted to purchase maps at large scale. It is also known that complete series of charts of the Skagerrak and Kattegat have recently been purchased for the USSR. Although these maps may be for normal peacetime use by the White Sea and Baltic fleets, the coincidence of the map purchases and the discovery of this new map suggests that

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C. Transportation Map of Turkey

The 1950 edition of the 1:800,000 Turkish transportation map is now available for loan from the CIA Map Library, extension 2596. Like the previous editions, dated 1948, 1945, and 1942, it consists of eight sheets printed in three colors. For all four editions, the CIA call number is 28814.

The 1950 edition reflects few of the changes that have taken place in Turkey in the last two years. Changes in the alignment or classification of a few dozen miles of road have been shown, existing railroads brought up to date, and all proposed railroads in Turkey deleted. Errors in the railroad pattern in the Balkans have been retained. Il and ilce boundaries in the northwestern part of Turkey have been changed in several places, in a few instances by more than 5 miles. It is not known whether the newer boundaries were in force at the time of the census of 22 October 1950.

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